IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Reunamaki, *et al.*

Title: DEVICE DISCOVERY AND CONNECTION
ESTABLISHMENT FOR AD HOC NETWORKS

Appl. No.:   10/772,255

Filing Date: 2/6/2004

Examiner: Yasin M. Barqadle

Art Unit: 2456

Confirmation   6861
Number:

AMENDMENT AND REPLY SUBMITTED ALONG WITH REQUEST FOR CONTINUED EXAMINATION UNDER 37 C.F.R. 1.114

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Examiner:

This Amendment and Reply is accompanied by a Request for Continued Examination (RCE), which is responsive to the Final Office Action dated November 24, 2008, concerning the above-referenced patent application, and the Advisory Action mailed February 9, 2009. February 24, 2009, was three months from the mailing date. Accordingly, with the acceptance of the accompanying petition for a one-month extension of time, and payment of the appropriate fee for an RCE set forth in 37 C.F.R. § 1.17(e), this response is timely filed.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks/Arguments begin on page 6 of this document.

Please amend the application as follows:

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1.　(Currently Amended) A method of forming a piconet in a wireless communications device, the method comprising:

transmitting a beacon packet from the wireless communications device across a wireless channel during a first predetermined time interval;

scanning the wireless channel from the wireless communications device for a second predetermined time interval, the second predetermined time interval immediately following the first predetermined time interval;

receiving a piconet joining request packet from a remote wireless communications device during the second predetermined time interval; and

transmitting a confirmation packet to the remote wireless communications device during a third predetermined time interval, the third predetermined time interval immediately following the second predetermined time interval and before transmitting a second beacon packet.

2.　(Original) The method of claim 1, wherein the piconet joining request includes a request for a role switch.

3.　(Original) The method of claim 2, further comprising
receiving a beacon packet from the remote wireless communications device.

4.　(Original) The method of claim 1, wherein the beacon packet, the piconet joining request packet, and the confirmation packet each include one or more OFDM symbols.

5.　(Original) The method of claim 1, wherein the wireless channel employs a frequency hopping pattern.

6.   (Previously Presented) A method in a wireless communications device, comprising:

transmitting a first beacon packet from the wireless communications device across a wireless channel during a first predetermined time interval;

scanning the wireless channel from the wireless communications device for a second predetermined time interval, the second predetermined time interval immediately following the first predetermined time interval;

receiving a request for additional information from a remote wireless communications device during the second predetermined time interval; and

transmitting the additional information with a second beacon packet across the wireless channel.

7.   (Original) The method of claim 6, wherein the additional information includes available services from the wireless communications device.

8.   (Original) The method of claim 6, wherein the additional information includes identifiers of devices that are in a piconet with the wireless communications device.

9.   (Original) The method of claim 6, wherein the wireless channel employs a frequency hopping pattern.

10.   (Currently Amended) A wireless communications device, comprising:

means for transmitting a beacon packet across a wireless channel during a first predetermined time interval;

means for scanning the wireless channel for a second predetermined time interval, the second predetermined time interval immediately following the first predetermined time interval;

means for receiving a piconet joining request packet from a remote wireless communications device during the second predetermined time interval; and

means for transmitting a confirmation packet to the remote wireless communications device during a third predetermined time interval, the third predetermined time

interval immediately following the second predetermined time interval and before transmitting a second beacon packet.

11.   (Original) A wireless communications device, comprising:

means for transmitting a first beacon packet across a wireless channel during a first predetermined time interval;

means for scanning the wireless channel for a second predetermined time interval, the second predetermined time interval immediately following the first predetermined time interval;

means for receiving a request for additional information from a remote wireless communications device during the second predetermined time interval; and

means for transmitting the additional information with a second beacon packet across the wireless channel.

12.   (Currently Amended) A wireless communications device, comprising:

means for monitoring a wireless channel for transmissions during a predetermined time interval;

means for receiving a beacon packet from a remote wireless communications device across the wireless channel during the predetermined time interval; and

means for, immediately following receipt of the beacon packet, sending a response packet to the remote wireless communications device without associating with the remote wireless communications device when the remote wireless communications device is the only device transmitting device during the predetermined time interval.

13.   (Currently Amended) A system for forming a piconet of a plurality of wireless communications devices, the system comprising:

a beacon-transmitting device that transmits a beacon packet across a wireless channel during a first predetermined time interval; and

a remote wireless communication device that receives the beacon packet and transmits a piconet joining request during a second predetermined time interval, the second predetermined time interval immediately following the first predetermined time interval,

wherein the beacon-transmitting device receives the piconet joining request packet during the second predetermined time interval and transmits a confirmation packet to the remote wireless communications device during a third predetermined time interval, the third predetermined time interval immediately following the second predetermined time interval_and before transmitting a second beacon packet.

14.   (Previously Presented) The system of claim 13, wherein the piconet joining request includes a request for a role switch.

15.   (Previously Presented) The system of claim 14, wherein the remote wireless communications device transmits the beacon packet and the beacon-transmitting device receives the beacon packet.

16.   (Previously Presented) The system of claim 13, wherein the beacon packet, the piconet joining request packet, and the confirmation packet each include one or more OFDM symbols.

17.   (Previously Presented) The system of claim 13, wherein the wireless channel employs a frequency hopping pattern.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1, 10, 12, and 13 are being amended.

A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. Claims 1-17 are now pending in this application. Applicants thank the Examiner for his detailed response.

I.   Response to the Examiner's Comments

With regard to claims 6 and 11, on page 3 of the Advisory Action, the Examiner remarked that:

> [T]he Examiner notes Simons teaches "One master/slave or star mode in which a ZigBee network operates in accordance with the protocol is that of "beaconing" data on a selected single radio channel, wherein a network coordinator sends out a periodic reference or beacon signal on a single radio channel which secondary stations (user devices) receive and react to. <u>The reference beacon contains indications (e.g. unique ID's) of those secondary stations for which data is intended or pending</u>, with the secondary stations responding in accordance with a multiple access protocol. All devices operating either on a star topology or a peer-to-peer topology have a unique 64 bit extended address." (0026). See also figure 4 where beacon signals with reference beacon contains indications (e.g. unique ID's) of those secondary stations for which data is intended or pending, with the secondary stations responding in accordance with a multiple access protocol as indicated above.

(Underlining added). **Para. [0026]** simply teaches that a beacon can contain a recipient's unique identifier; **Para. [0026]** does not teach that any "additional information" is included with the beacon. Additionally, FIG. 4 merely shows a placeholder for the beacon signal 40: "[t]he beacon signal is transmitted in the first slot of each superframe." (**Para. [0037]**). Thus, as in the ZigBee standard, <u>Simon</u> simply discloses that a unique ID (or station address) is sent in every beacon.

Since the unique ID is simply an address for the secondary stations of <u>Simon</u>, the unique ID cannot be "additional information" because <u>additional information is **requested**</u>, as recited in element three of claim 6: "receiving a request for additional information from a remote wireless communications device." Hence, the additional information of claims 6 and 11 is not the same as the unique ID in <u>Simon</u> which is never requested. Therefore, Simon does not teach "receiving a request for additional information from a remote wireless communications device during the second predetermined time interval" or "transmitting the additional information with a second beacon packet across the wireless channel" as recited by claims 6 and 11.

Furthermore, in <u>Simons</u>, anything resembling additional information would have to be treated as regular data. As discussed below, <u>in Simons, data is transmitted and received in one of the "guaranteed time slots"</u> **(FIG. 4** and **Para. [0038].) and not with the "second beacon packet"** <u>as in claims 6 and 11.</u> Further explanation is included below in Section <u>II.B</u>. Hence, <u>Simons</u> fails to disclose, teach, or suggest "transmitting the <u>additional information with a second beacon packet</u>" as required by claims 6 and 11.

II.   <u>Rejections under 35 U.S.C. §§ 102 and 103</u>

On page 6 of the Office Action, the Examiner rejected claims 1-3, [6], 7-8 and 10-15 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication 2006/0072491 (hereafter "<u>Simons</u>"). Applicants note that independent claim 6 is included in the 102(e) rejection section but is not recited in the initial rejection; Applicants respectfully request that the inconsistency be corrected. On page 9 of the Office Action, the Examiner rejected claims 4-5, 9, and 16-17 under 35 U.S.C. § 103(a) as unpatentable over <u>Simons</u> in view of U.S. Patent Application Publication 2004/0170217 (hereafter "<u>Ho</u>"). Applicants have amended claims 1, 10, 12 and 13 and, thus, the rejections (alone or in combination) of claims 1-5, 10, 12 and 13-17 are moot. Further, neither <u>Simons</u> nor <u>Ho</u> anticipate claims 1-5, 10, 12 and 13-17, as amended. Applicants respectfully traverse the rejection of claims 6-9, and 11.

Claims 1, 10, and 13

A. Simons Does Not Teach A Third Time Interval Before Transmitting/ Receiving A Second Beacon Packet

On page 4 of the Office Action, the Examiner states:

> As currently claimed, the time intervals are not required to be the deciding factor as to whether an action occurs or does not occur. Rather, a time interval may be simply defined according to what action is occurring, as detailed above. Accordingly, the instant claim should be amended to clearly define how the time intervals are predetermined, what constitutes a time interval, and how it is determined that a time interval is beginning and ending in such a way that makes it clear what the relationship between the time interval and the actions are.

Accordingly, Applicants have amended the independent claims 1, 10, and 13 to include the element "before transmitting a second beacon packet" in order to overcome the Examiner's rejections. Support for the amendments can be found in at least **FIGS. 6A, 6B, and 7, Para. [0007], [0057]-[0066]**. Neither <u>Simons</u> nor <u>Ho</u> disclose, teach, or suggest "transmitting a confirmation packet to the remote wireless communications device during a third predetermined time interval, the third predetermined time interval immediately following the second predetermined time interval <u>and before transmitting a second beacon packet</u>" (Underlining added.) as required by claims 1, 10, and 13.

The only substantial disclosure in <u>Simons</u> related to forming a piconet is in **Para. [0029]**. **Para. [0044]-[0045]** briefly describe "prevent[ing] future requests for registration." **Para. [0027]-[0029]** briefly describe registration. In particular, **Para. [0029]** states:

> <u>The ZigBee scheme provides basic registration or enumeration processes wherein a secondary station wishing to join a piconet scans for beacons.</u> (An example of a registration process is described in applicant's co-pending international application WO0128157 published 25 Oct. 2001, incorporated herein by reference and to which the reader is now directed). <u>Upon detecting a beacon it may then request registration in which network and device ID's are exchanged</u> (ZigBee defines 64 bit unique identifiers for a device, although in use it is preferable for a coordinator to

> allocate a device a shorter 16 or 8 bit radio code/identifier). The coordinator stores a routing table of these allocated codes for messaging. <u>Following registration the device is able to exchange radio messages with the coordinator,</u> whilst ignoring messages from other networks or other devices on its network via the ID's representing source/destination/network addresses in header fields of the radio messages.

(Underlining added.) <u>Simons</u> merely states that a registration process takes place. However, **<u>Simons</u> does not teach, disclose, or suggest how the referenced "basic registration or enumeration processes" works with enough detail**. Rather <u>Simons</u> teaches how "devices compete for channel access." (**Para. [0037].**) **Therefore, in <u>Simons,</u> the devices are already registered whereas the present claims are directed towards <u>forming a piconet.</u>**

<u>Ho</u> teaches "wireless personal area networks with frequency hopping and rotation sequences." In <u>Ho</u>, like <u>Simons</u>, the devices are already registered. <u>Ho</u> explicitly states that piconet has already formed: "FIG. 1 shows a number of electronic devices that <u>have</u> cooperated to form two piconets." (**Para. [0012].**)

Neither an anticipatory nor an obviousness rejection can be properly maintained where the reference(s) used in the rejection does not disclose all of the recited claim elements. Therefore, for at least the above reasons, Applicants respectfully request withdrawal of the rejection of claims 1, 10, and 13. Claims 2-5 include the elements of claim 1; and claims 14-17 include the elements of claim 13. Therefore, Applicants respectfully request withdrawal of the rejection of claims 1-5, 10, and 13-17.

Claims 6 and 11

B.   Simons Does Not Teach Additional Information With A Second Beacon Packet

On page 8 of the Office Action, the Examiner argues:

> [a]s per claims 6 and 11, Simons teaches the method in a wireless communications device (fig. 1 and abstract), comprising: … receiving a request for additional information from a remote wireless communications device during the second predetermined time interval (¶ 0023, and ¶

0027-0029 and ¶ 0031-0035); and transmitting the additional information with a second beacon packet across the wireless channel (¶ 0023, and ¶ 0029 and ¶ 0031-0040).

Applicants respectfully disagree. Neither <u>Simons</u> nor <u>Ho</u> disclose, teach, or suggest "transmitting the additional information with a second beacon packet" as required by claims 6 and 11.

Para. [0029] describes that the system of <u>Simons</u> may be used at an airport. **Para. [0027]-[0029]** briefly describe registration as discussed above. **Para. [0031]-[0040]** describes the structure of the system of <u>Simons</u> and "compet[ing] for channel access." In particular, **Para. [0031]** states: "The processor also has a link 26 (which may be via a local area network (LAN), or the internet for example) to a database 28 (DB) which stores information (e.g., flight departure gate, flight delay) that may be supplied to a users device 12a,b,c." In particular, **Para. [0035]** describes "an example structure of a radio header/payload data packet or message."

However, <u>Simons</u> does not disclose, teach, or suggest "transmitting the additional information <u>with a second beacon packet</u>" as required by claims 6 and 11. The only information that <u>Simons</u> describes in the Examiner's citations is data stored in a database (**Para. [0031]**.) and data in a data packet (**Para. [0035]**.) <u>Notably, this data is transmitted and received in one of the "guaranteed time slots" (**FIG. 4** and **Para. [0038]**.) and not with the "second beacon packet" as in claims 6 and 11.</u> Likewise, the registration process of **Para. [0027]-[0029]**, as constructed by the Examiner, on page 2 of the Office Action, fails to use a "a second beacon packet" to "transmit[] the additional information." Furthermore, "additional information" which is enabled in the present specification is sufficiently distinct from the payload data described in <u>Simons</u> or the "network and device ID's" argued by the Examiner on page 2 of the Office Action.

Neither an anticipatory nor an obviousness rejection can be properly maintained where the reference(s) used in the rejection does not disclose all of the recited claim elements. Therefore, for at least the above reasons, Applicants respectfully request withdrawal of the rejection of claims 6 and 11. Claims 7-9 include the elements of claim 6. Therefore, Applicants respectfully request withdrawal of the rejection of claims 6-9 and 11.

Claim 12

C.   Simons Does Not Teach Without Associating With The Remote Wireless Communications Device

On page 9 of the Office Action, the Examiner argues:

> "[a]s per claim 12, Simons teaches a wireless communications device fig. 1 and abstract, comprising: … means for, immediately following receipt of the beacon packet, sending a response packet to the remote wireless communications device when the remote wireless communications device is the only device transmitting device during the predetermined time interval (¶ 0026-0029 and ¶ 0047)."

Applicants have amended independent claim 12 include the element "without associating with the remote wireless communications device." Support for the amendment can be found in at least **Para. [0043]**. The rejection of claim 12 is, therefore, moot. Neither <u>Simons</u> nor <u>Ho</u> disclose, teach, or suggest "means for, immediately following receipt of the beacon packet, sending a response packet to the remote wireless communications device <u>without associating with the remote wireless communications device</u> when the remote wireless communications device is the only device transmitting device during the predetermined time interval" as in claim 12.

As discussed above, the only substantial disclosure in <u>Simons</u> related to forming a piconet is in **Para. [0029]**. **Para. [0026]-[0029]** briefly describe registration (i.e. associating). <u>Simons</u> merely states that a registration process takes place. However, <u>Simons</u> does not teach, disclose, or suggest how the referenced "basic registration or enumeration processes" works with sufficient detail to teach or suggest the elements of the amended claims. Rather, <u>Simons</u> teaches how "devices compete for channel access." (**Para. [0037]**.) Therefore, in <u>Simons</u>, the devices are already registered whereas the present application and claim are directed towards the time before registration. Likewise, <u>Ho</u> teaches "wireless personal area networks with frequency hopping and rotation sequences." In <u>Ho</u>, like <u>Simons</u>, the devices are already registered. <u>Ho</u> explicitly states that piconet has already formed: "FIG. 1 shows a number of electronic devices that <u>have</u> cooperated to form two piconets." (**Para. [0012]**.)

An anticipatory rejection cannot be properly maintained where the reference used in the rejection does not disclose all of the recited claim elements. Therefore, for at least the above reasons, Applicants respectfully request withdrawal of the rejection of claim 12.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extension of time is needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any extension fee to Deposit Account No. 19-0741.

Respectfully submitted,

Date ___March 23, 2009_____   By _____

FOLEY & LARDNER LLP   Callie M. Bell
Customer Number: 23524   Attorney for Applicant
Telephone: (608) 258-4263   Registration No. 54,989
Facsimile: (608) 258-4258